Preface

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CONT08 is the latest campaign of continuous very long baseline interferometry (VLBI) observations covering 15 days during August 2008. In this special issue of *Journal of Geodesy*, we have collected six valuable scientific manuscripts that concentrate on using VLBI observations from this campaign or investigate geodetic and geophysical phenomena of the same period employing meteorological or other space-geodetic observations.

Roughly every three years the International VLBI Service for Geodesy and Astrometry (IVS) invests considerable efforts into the organization, the observations and the analysis of the CONT series. Unlike the normal IVS observing schedule of 2–3 disjunct 24-h observing sessions per week, the volume of observations is extended considerably to a larger network of 11 of the most powerful radio telescopes, encompassing a continuous operation of 15 days. This ambitious experiment can only be achieved if the resources of recording media and the mechanics of the radio telescopes participating are driven to their ultimate limits. Consequently, the CONT sessions can take place only every few years and then mark highlights in the operations of the IVS. Special scheduling options have to be considered to permit such a

long continuous operation of the radio telescopes with short staggered interrupts for the necessary maintenance tasks.

During the CONT08 period, August 12–26, geodetic VLBI demonstrates its high capabilities to observe simultaneously all components of the transformations between the quasi-inertial reference frame realized by quasars and the terrestrial reference frame materialized through radio telescopes. The resulting series of Earth orientation parameters (EOP) in various parameterizations and time resolutions are of excellent quality; hence, analyses may be performed with these data sets. At the same time, auxiliary parameters for the ionosphere and the atmosphere can be inferred from the observations, providing ample scope for investigations into the excitation mechanisms which cause variations in Earth rotation. Furthermore, other observing techniques were called upon to provide their results for independent comparisons and validations of the EOPs.

In this Special Issue, the manuscripts describe research that has been carried out with data collected at the time of the CONT08. When geodetic VLBI data are analyzed, zenith wet delays have to be estimated to include remaining refraction effects in the functional model. Analysis of discrepancies between results of different analysis centers provides a valuable insight into the remaining difficulties of interpreting the zenith wet delays. A big advantage too is that observations of GPS and DORIS data as well as of water vapor radiometers have been gathered at the same time and were analyzed in the context of CONT08 for comparison with the VLBI results. Concerning EOP, the CONT08 VLBI observations have also been used for testing the quality and the perspectives for single-baseline UT1-UTC determinations where again atmospheric refraction plays an important role. The transfer between the solid Earth and the atmospheric angular momentum (AAM) forms the main excitation mechanism for variations in Earth rotation. During the CONT08

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campaign, AAM data were made available specifically with an hourly resolution. AAM analyses and forecasts were used to investigate the impact on UT1 predictions. Finally, the ionosphere and its total electron content have been a topic for research in the CONT08 period. All these investigations have demonstrated that the CONT sessions are not only of interest to the VLBI community, but they extend also to other geodetic disciplines.

We want to thank all the individuals who helped to make the CONT observations possible. Without their dedicated

engagement to operate and maintain the radio telescopes continuously over such a lengthy period, this type of project would not have been feasible. Special thanks should also be conveyed to the staff of the Mark 4 Correlator at the Washington Correlator Facility operated by the U.S. Naval Observatory and NASA Goddard Space Flight Center for their efforts in guaranteeing coherent and homogenous processing of the data. This issue will become a noteworthy document demonstrating the concrete results of their dedication.